

CAN WE MAKE RED LIGHT RUNNERS STOP?
Red Light Photo Enforcement in San Francisco, California

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ABSTRACT

Violating red lights is a serious safety issue. In recent years awareness of this problem has become especially acute in the United States. With its compact driving environment and dense network of signalized intersections, red light running in San Francisco reached a political crisis in 1994.

The City and County of San Francisco recently completed a pilot red light photo enforcement program. The number of vehicles photographed violating red lights at the photo enforced locations dropped by more than 40 percent just six months into the pilot. Recent statistics indicate that San Francisco's combined efforts to combat red light running have resulted in a significant decrease in the number of annual collisions caused by red light violators citywide.

Based on the success of the pilot and supportive state legislation, San Francisco is moving forward to expand the red light photo enforcement program. This collaborative effort involving several agencies will soon be one of the largest programs in the United States with twenty-six cameras rotated through thirty-five intersections.

San Francisco's experience with red light photo enforcement is valuable for all jurisdictions considering the use of automated enforcement. This paper contains discussion of the level of preparation required to initiate a program, legal framework, cost effectiveness of automated enforcement, criteria for site selection, and suggestions for increasing citation issuance rates. Recommendations from San Francisco's experience stress the importance of creating partnerships within your agency and without, combining engineering and enforcement efforts with an educational campaign, and influencing local legislation.

INTRODUCTION

Nationally red light violators cause a significant number of collisions and injuries. According to the Insurance Institute for Highway Safety, red light runners cause about 750 deaths and more than 260,000 injuries every year⁽¹⁾. In San Francisco, red light violators cause approximately 25 percent of all injury collisions at signalized intersections. Over the past five years San Francisco motorists running red lights have averaged 786 injury crashes with 1,324 annual injuries according to the Department of California Highway Patrol, State Wide Integrated Records System. Based on this average, red light violators cost the local San Francisco economy approximately \$40 million each year not including property damage costs⁽²⁾.

Although cities throughout Europe, Australia and Canada have used photo enforcement of red light violations since the 1970s⁽³⁾, American cities have been slow to take advantage of the available technology. The Los Angeles County Metropolitan Transportation Authority began automated enforcement at grade crossings of the Los Angeles/Long Beach Blue Line in 1992. Gate violations decreased more than 90 percent at some locations⁽⁴⁾. Following on the heels of this experience, California's Legislature passed a bill allowing automated enforcement at railroad grade crossings in 1994⁽⁵⁾. In 1993, New York City became the first major U.S. city to implement a red light photo enforcement program. Within a year, New York issued 168,479 tickets with just 15 cameras in place. After three years of photo enforcement and an average conviction rate of 85 percent, red light violations at photo enforced locations in New York City reduced by nearly 60 percent⁽⁶⁾.

In October 1994, a motorist ran a red light near San Francisco State University. The driver swerved to avoid another vehicle and lost control, injuring 13 pedestrians waiting for a bus. This led then Supervisor Susan Leal to wage a campaign to utilize cameras for red light photo enforcement in San Francisco. The San Francisco public and media rallied her cause.

At San Francisco's urging the California Legislature built on the success of automated enforcement at railroad grade crossings by extending the authority to use automated enforcement at signalized intersections⁽⁷⁾. Unlike most other jurisdictions utilizing automated enforcement, California's law assigns liability to the driver and not the registered owner of the vehicle. This law took effect in 1996, including a three-year 'sunset' clause allowing the program to be tested through the end of 1998.

TECHNOLOGY

Since California law requires a “clear photograph of a vehicle’s license plate and the driver of the vehicle”⁽⁸⁾, cameras must photograph vehicles from the front. Cameras rotate among specially made housings at each monitored intersection approach. Motorists cannot easily distinguish which housings contain cameras and which do not. Camera poles stand several feet back from the traffic signal equipment and typically view no more than four lanes of approach traffic. Inductive loops placed just outside the intersection trigger cameras. Each enforced approach lane contains two successive loops, allowing the enforcement system to calculate the speed of passing vehicles. In San Francisco the vehicle speed must be greater than 24 kilometers per hour (15 miles per hour) to trigger a photograph. Cameras only receive power when the signal is red. Therefore, they can only take photographs when the vehicle is illegally entering the intersection on the red signal. Violators receive a grace period: cameras will not photograph vehicles entering the intersection until after the signal has been red for 0.3 seconds. The camera first photographs the vehicle as it illegally enters the intersection. The camera takes a second photograph when the vehicle is in the center of the intersection, allowing for a clear photo of the driver. The timing of the second photograph depends on the speed of the vehicle and the width of the intersection: the faster the vehicle, the shorter the time between the first and second photographs.

PILOT PROJECT

Preparation

With a new law in place and support from the media, public, and local officials, San Francisco welcomed all interested vendors to participate in a pilot red light photo enforcement program involving six intersections. Three vendors came forward but due to some unforeseen hurdles, only two remained interested when it came time for implementation.

One early obstacle to implementing the project was that each vendor had to secure access to both the Department of Motor Vehicles' (DMV) registration and driver's license databases. Because of California's driver's liability law, access to the DMV's driver's license database is essential. For photo enforcement citations, Municipal Court Commissioners in San Francisco require that the address for the registered owner match that from the driver's license file on record with the DMV. The project experienced delay while one of the vendors sought permission to access these records.

Another delay occurred developing a special Notice to Appear form to meet the approval of the California State Judicial Council. Alleged violators receive this form to notify them of the violation. Fortunately, California legislators made a special provision in the law to allow the Notice to Appear for photo enforcement citations to be mailed⁽⁹⁾. All other red light violations require motorists sign a Promise to Appear for citations issued by police officers in the field⁽¹⁰⁾. After much debate the Judicial Council approved a form now used not only in San Francisco but also throughout California.

San Francisco escorted a standardized photo enforcement sign through the California Traffic Control Devices Committee. The sign approved for use statewide is a collaboration of San Francisco's design and input from the California Department of Transportation (Caltrans). According to California's law, jurisdictions utilizing automated enforcement must post these signs at each monitored intersection or at all major entrances to the city.

After clearing hurdles for all California jurisdictions interested in red light photo enforcement, San Francisco began issuing photo enforcement citations in October 1996. Two vendors, Electronic Data Systems (EDS) and U.S. Public Technologies (USPT), participated in the pilot project, each initially responsible for two intersections.

Funding

San Francisco paid \$30,000 to each vendor to install all necessary equipment including loops, wires, poles, and cameras at each monitored intersection. The vendors also received \$17.50 per paid citation, San Francisco's portion of each \$104 fine paid by violators. All above the ground equipment, including cameras, poles and housings, remained the vendor's property.

Early in the pilot project it became evident that \$17.50 per paid citation was inadequate to fund a full-scale program. EDS withdrew from the program after six months citing the financial shortfall. USPT continued, taking over one of the EDS locations, and finished out the pilot operating five cameras at five intersections. San Francisco urged the State Legislature to increase the fine for red light violations.

Legislation

Until 1998, the revenue received by local California agencies from red light violations was not adequate to make photo enforcement self-financing. Many local government officials may support the program in principle, but are not willing to sacrifice funding for other programs to implement photo enforcement. In 1997, the California legislature addressed this shortfall by raising the fine from \$104 to \$271 for running red lights⁽³⁾. With this change, the Legislature also changed the formula for distributing the fine revenues so local agencies now receive almost \$148 from each fully paid citation.

This year controversy sprung up over a bill to eliminate the sunset clause on the law authorizing red light photo enforcement⁽¹¹⁾. Both the State Senate and Assembly Transportation Committee approved this bill quickly. It hit a snag on its first pass through the full Assembly when it fell four votes short of the 41 needed for passage. One month later the bill passed the Assembly with 49 votes. The bill then received not only the Governor's signature, but also his endorsement at a press conference on June 1, 1998. The media provided much coverage on the controversy and arguments associated with the first unsuccessful vote, but not much about the bill being signed into law. Opponents of the bill argued loudly about unfair intrusions into the rights of motorists. Former San Francisco Supervisor Susan Leal's response to this charge is, "Being hit by a 3,000-pound car is a real invasion of one's rights."⁽¹²⁾

Building a Team

A project as complex as red light photo enforcement cannot work without teamwork by many public agencies, elected officials, and private contractors. San Francisco's pilot project represents a coordinated effort with many city departments including the Police, Municipal Court, Public Works, City Attorney, District Attorney, Public Health, and Parking & Traffic. Being both a city and a county agency helps San Francisco to coordinate the efforts of such diverse departments. For a photo enforcement program to be effective, all agencies involved must work well together to attend to the many details of the effort.

The Department of Public Health's "Stop Red Light Running" campaign, sponsored in part by the Federal Highway Administration, has been an important factor in the success of the photo enforcement in San Francisco. The Campaign distributed "I Stop for Red Lights" bumper stickers, posted "Red Means Stop" billboards, held press conferences, and inspired many media stories about the dangers of red light running. The public and media interest helped spur widespread coverage of the Campaign. In follow-up

surveys conducted by the Department of Public Health, 61 percent of San Francisco drivers were aware of the camera program and 29 percent had seen or heard messages from the Campaign (unpublished data).

The Department of Public Health determined that red light running is a public health problem that requires a change in attitudes to resolve. Campaign strategy aimed at attitude changes similar to those required to get people to wear seat belts, place children in car seats, and to stop drinking and driving. The department sponsored focus groups that divided red light runners into two groups, aggressive drivers and distracted drivers, in an effort to understand the psychology of red light running and target campaign messages appropriately. The Campaign found that most red light runners in San Francisco are professional males over 40 years of age (unpublished data).

Obviously, the Police Department plays a pivotal role in enforcing red light violations. Trained police officers review all citations before issuance. Working closely with the Municipal Court and City Attorney, the Police developed policies and procedures for reviewing and signing photo enforced citations. San Francisco takes a conservative approach to photo enforcement to protect the integrity of the program and the rights of individuals photographed. For example, all passengers are blocked on violation photographs sent to alleged violators.

Along with this effort, the Police have maintained an increasingly active presence on the streets. Since San Francisco began red light photo enforcement, the Police have issued more citations to red light violators. In 1996 they issued nearly 20,000 citations and about 22,000 in 1997. Previously their average issuance was 15,000 to 18,000 red light violation citations per year. The Police Department is also testing a red light enforcement pilot, adding a squadron of motorcycle officers specifically targeting red light violations.

San Francisco's Parking Control Officers also support the photo enforcement program by cracking down on vehicles without front plates. They issued over 48,000 such citations in 1997, six times their previous average. California requires front plates, but consistently about 15 percent of vehicles photographed violating red lights do not have them. The current fine in California is only \$25 for not displaying a front plate, which reduces if motorists replace the plate. The city of Yuba City, California has taken the initiative to raise this fine locally to act as a stronger incentive to display both plates. The new fine is \$150 with a reduction to \$75 once corrected (John Buckland, unpublished data).

RESULTS

Since October 1996 the pilot red light photo enforcement program has issued nearly 10,000 citations. San Francisco Municipal Court records indicate that violators pay these citations at rates comparable to citations issued by Police officers in the field (approximately two-thirds paid). According to California law, violators who fail to respond to the mailed Notice to Appear have a hold placed on their driver's license and on their vehicle registration.

The first six months of the pilot project showed that San Francisco's approach is effective. The number of red light runners at photo enforced intersections dropped more than 42 percent. In a separate study in Oxnard, California, the Insurance Institute for Highway Safety also recorded a 42 percent reduction in red light violations. The Oxnard study included locations not equipped with cameras and found that there was a "spill over" effect at these locations as well(3).

The most notable impact of the pilot program may be a citywide reduction in collisions and injuries caused by red light violators. Although statistically it is too early to conclude that efforts to reduce red light running in San Francisco are responsible for this reduction, the future looks promising. Table 1 shows statistics from the State Wide Integrated Traffic Records System. Comparing data from the previous five years, there was a 9 percent reduction in injury collisions caused by red light violators in 1997.

PILOT EVALUATION

Cost Effectiveness

Debate continues nationwide on whether it is more cost-effective to use cameras versus police officers in the field. Given the low issuance rate and the high cost of automated enforcement, this is a valid concern. However, red light photo enforcement has the advantage of operating 24 hours per day. It also may have a spill over effect (3), most likely because drivers cannot always keep track of the monitored locations. It is also likely that the cost of photo enforcement in the United States will drop as more cities start programs, technology develops, and the law evolves.

Cameras are clearly not a replacement for police officers. San Francisco's expanded program is considering 35 intersections; but has more than 1,000 signalized intersections. Obviously, the Police are always going to be a critical part of enforcing red light violations. In addition, police officers enforce many laws besides red light running. Ideally, an automated enforcement program is one component of a broad-based traffic safety program including engineering, education and enforcement.

Fortunately, the increased fine established in California provides the resources to support such a program. The bottom line is that photo enforcement, in combination with education and stiff police enforcement, has shown that it can increase public safety in a revenue neutral manner.

Site Selection

In the pilot program, project staff selected intersections based on five criteria:

1. Number of collisions caused by red light running
2. Suggestions from community groups
3. Suggestions from the Police Department
4. Geographical dispersion
5. Political and historical factors

It is also important to consider several other factors. Construction difficulties such as inadequate conduit space, sub-sidewalk basements (typical in San Francisco), and other obstacles to installing detector loops or conduit can greatly increase the cost of a program. Field observations of red light violators at prospective intersections is useful before selecting locations, especially to determine which intersection approach is best for photo enforcement. Time and effort can be saved when working with community associations by giving them a list of priority intersections and asking for their comments, rather than asking for their list of candidate intersections for photo enforcement.

Of the various considerations and criteria, the best indicator of red light running is the number of collisions caused by red light violators. However, experience shows that engineering solutions should be considered first. The intersection near San Francisco State University where the 1994 collision took place that inspired the program was one of the first locations equipped for photo enforcement. After traffic

engineers modified the signal progression, red light running virtually stopped at this location. Preliminary data from other pilot intersections suggests that engineering solutions can often reduce red light violations significantly. Several pilot locations are undergoing engineering improvements, such as increasing the amber interval and the introduction of mast arms. The presence of photo enforcement equipment at these intersections will allow San Francisco's traffic engineers to learn more about the effectiveness of various engineering improvements on making red light runners stop. Future locations with the potential for such engineering solutions are not being considered for the program expansion.

Photographs on the Citations

During the first year of the pilot program, EDS printed photographs on each citation issued while USPT provided prints for public viewing. San Francisco's staff concluded that there are substantial benefits to printing the photographs on the citation. Registered owners do not have to visit the court to view the photographs. People are less likely to tie up the court by contesting when they can see the photographs up front. San Francisco's program now provides four photographs on each citation: one of the vehicle entering the intersection, one of the vehicle clearing the intersection, a close-up of the driver's face, and a close-up of the license plate.

FUTURE OF RED LIGHT PHOTO ENFORCEMENT

California's law requires a clear photograph of the driver. The intent of the legislation is that driver's receive a point on their driving record for this moving violation. An important consequence of this requirement is that the issuance rate in San Francisco is approximately 25 percent of all vehicles photographed running the red. It is difficult to obtain a clear photograph of the driver due to glare on windshields, dark interiors, blocking by other vehicles, etc. The issuance rate would more than double if driver identification was not necessary and the only requirement for issuing citations was a clear photograph of the license plate. In 1998, San Francisco Assembly Member Kevin Shelley introduced a bill to the State Legislature in an attempt to make this change. However, after the controversy over the removal of the sunset clause in the Spring of 1998 and continued debate about how this bill should work, Assembly Member Shelley shelved his registered owner liability bill. Most agree that for cases where the driver is not identifiable, the registered owner should not receive a point against their driving record. Some debate continues about whether to assess points only to convicted drivers, or to eliminate points altogether as in New York State and under Maryland's new law. In 1999, Assembly Member Shelley plans to introduce his registered-owner liability bill again. This bill would also eliminate points when the violation is observed using automated enforcement. How the law will evolve in California is still an open question.

On a national level, Transportation Secretary Rodney Slater announced a national campaign to halt red light running at a press conference on April 30, 1998⁽¹³⁾. The program will include safety education, increased police presence and red light photo enforcement.

Since the Governor has approved the bill to remove the sunset clause from California's automated enforcement law, San Francisco can now move forward to expand the red light photo enforcement program to 35 intersections. San Francisco executed a contract with USPT in December 1998 to install camera equipment at 26 intersections. Photo enforcement should be operating at these intersections by Summer 1999. Caltrans has agreed to fund five additional locations as part of a roadway project, and the Moscone Center Expansion Project will fund four additional locations through separate contracts, which are expected to begin by Fall 1999.

CONCLUSION

Overall, San Francisco's experience has been enlightening and gratifying. San Francisco's public, media, and elected officials have all supported the program and worked hard to make it a success. The drop in red light runners and the drop in collisions justify continuing and expanding the program. San Francisco's pilot red light photo enforcement program has shown that we can make red light runners stop. Red light photo enforcement is one tool to make this happen.

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